



PSYCHOLOGY AND ADHERENCE IN TYPE 1 DIABETES

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SUMMARY

Among the various pathologies that generate distress, Type 1 Diabetes (DMT1) is a chronic illness with a high level of “social and psychological impact” and high “emotive potential”. In managing diabetes there is growing use of the concept of Adherence (patient agreement with treatment), with specific education aimed at developing self-care abilities in the patient. Both clinical experience and medical literature, however, demonstrate that many adult patients with DMT1 find it difficult to adapt to the self-care processes. In this paper we explore the personality traits of a sample of DMT1 patients who are experiencing difficulties with Adherence and their interaction with biomedical and social factors, in order to make it possible to devise and implement psychological interventions that are more appropriate and which focus on reducing “psychic episodes” and an improvement in the level of Adherence.

Keywords: Chronic disease, Type 1 Diabetes, Compliance, Adherence, Personality factors, Self care processes, Psychological, biomedical and social factors interaction.

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INTRODUCTION

The frequency of psychic disturbance in medical pathologies varies between 16% and 60% depending on the medical population studied. The frequency of psychic disturbance in diabetes is 15-20% (Furlan, Ostacoli, 2009). There are various difficulties correlated with the development of organic pathologies that affect the social, family and economic situation of the patient. Among the various pathologies that generate stress, Type 1 Diabetes (DMT1) is a chronic illness with high "social and psychological impact", since it affects young people who will subsequently be affected by serious complications, with high "emotive potential" due to its chronic invalidity effects. The elements of greatest interest set out in the scientific literature on DMT1 concern: self-care difficulties, mood swings, anxiety components, eating behaviour disturbances, stress management ability (Chiodo Martinetto, Farri, Comoglio, Giorda, 2010).

In 2003, the World Health Organisation promoted the term Adherence with reference to chronic pathologies, indicating "the behaviour level of a person who takes medicines, follows a diet and/or lifestyle". In the management of diabetes too the concept of compliance (obedience in taking a prescription) has given way to that of Adherence (agreement, acceptance of treatment), which in terms of empowerment involves specific education aimed at developing the patient's self-care ability. Encouraging patient Adherence in diabetology calls into question the importance of the psychomedical approach and multiprofessional teams (Diabetological Doctor, Dietician, Psychologist, Nurse, General Practitioner, other specialist doctors), since DMT1 requires patients to modify their lifestyle and achieve self-management ability.

More specifically, treatment of the pathology is complex. The patient must learn to frequently measure his glycemia (five times a day at set times, to permit calculation of Glycated Hemoglobin, HbA1c, the index of average glucose levels over the previous 60-90 days), administer insulin to himself (five times a day, with set doses and times), but also adjust doses on the basis of the glycemic values observed, the carbohydrates content of his meal and his physical activity. Despite the fact that injecting insulin has been simplified with the use of specific devices, clinical experience and medical literature demonstrate that many adult patients with DMT1 have difficulty in adapting to the continual self-care processes, since there are many factors - biological, social, psychological and cultural - that influence them.

Non adherence is a phenomenon of such extensive proportions (from 15% to 93%) and with such serious consequences that it has been defined as an "invisible epidemic" (Clepper, 1992). Glasgow, McCaul and Shafer (1987) have highlighted that diabetic patients exhibit satisfactory percentages of adherence to pharmacological treatment (use of insulin), but are poor at adhering to prescriptions regarding diet restrictions and regular physical exercise. With respect to socio-demographic variables, it can be observed that very young and old patients are less rigorous than patients of intermediate age. Social support, on the other hand, is a predictor of adherence, especially if it is expressed as an index of the quality of affective relationships rather than simply the number of persons known.

The complexity of the therapeutic regime, particularly as regards diet, inevitably also involves the patient's family. For this reason, the emotional support received from a spouse or another member of the family facilitates compliance with the prescriptions (Sherbourne, 1992). In the case of DMT1, moreover, youngsters can experience some difficulties in adapting to the illness, because in this transition phase there are various factors that can impede the integration of a management system of such complexity within their daily regimes. With respect to variables related to the illness, diabetes is an asymptomatic illness, hence adherence is also lower because the symptomatology is not modified in any perceptible way by taking medicines or respecting prescriptions (Gentili P, Di Berardino, Parmentola, 2007).



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The medical literature relative to DMT1 has explored the specific features of adult diabetic patients with poor levels of treatment adherence/compliance, highlighting above all the symptomatological aspect.

For this reason, in this paper we intend to specify and describe the personality features of a sample of DMT1 patients experiencing difficulty in Adherence and their interaction with biological and social factors. A more detailed knowledge of DMT1 and poor Adherence to treatment will make it possible to devise more appropriate psychological interventions, aimed at improving/containing "psychic disturbances", Adherence and resources optimisation.

METHOD

The work seeks to analyse the personality factors of a group of adult patients suffering from DMT1, while also verifying whether there are significant differences relative to gender, age or other biomedical variables (years of suffering from diabetes, glycated hemoglobin Hba1c, Body Mass Index -BMI) and whether there are significant relationships between personality factors and biomedical variables.

The research sample comprises adult patients being cared for by the Diabetology and Metabolic Illnesses Unit of ASL TO 5 (Piedmont Region), with DMT1 diagnosis and with difficulty in Adherence/compliance to treatment as well as difficulty in accepting the illness. The sample comprises 81 subjects of male and female gender, with age ≥ 18 , resident in the municipal districts covered by ASL TO 5. The sample inclusion criteria are: DMT1 diagnosis and difficulty in Adherence to treatment, absence of previous psychological pathologies, knowledge of Italian language.

The definition of "adherence" was carried out by the diabetological doctor responsible for the patients on the basis of clinical criteria and specific parameters: % HbA1 ≥ 6.5 , BMI ≥ 25 , indicators of regularity as highlighted by a likert scale specifically used at ASL TO 5. All patients display critical features in at least one of these indicators. In addition to a specific inquiry regarding the collection of socio-demographic variables, for the medical evaluation reference was made to the data present in the computerised clinical files of the patients, while for the psychological evaluation a battery of self-report instruments was used, duly chosen in order to highlight the interaction of symptomatological aspects and prevailing subjective factors.

Patient recruitment occurred via telephonic contact of nurses and doctor with all patients having DMT1 being looked after by the diabetology service of ASL TO 5. The patients taking part in the research were individually given questionnaires, on the day of their diabetology examination, by the Psychologist, Dr. Chiodo Martinetto, in the Diabetology Out Patients Clinic. They also had an individual clinical psychological discussion to further explore their diagnostics.

INSTRUMENTS

Specific instruments were used to detect variables in the Biomedical, Psychological and Social Area. The following were used for the biomedical area evaluation: Eurotouch (AMD) clinical files to highlight years of illness, value of HbA1c-Glycated Hemoglobin and BMI; Regularity indicators scale (Diabetology Unit ASL TO 5) to highlight eating regularity (diet and carbohydrates) and insulin regularity (respect for times and use of correct technique).

For the Psychological Area evaluation, the Big Five Questionnaire- BFQ2 (Caprara, Barbaranelli, Borgogni, Vecchioni, 2007) was used to highlight 5 personality factors: Energy - trusting and enthusiastic approach to life; Friendliness - features like altruism, taking care of oneself, giving emotional support and, on the other hand, hostility, indifference, egotism; Conscientiousness - features like



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precision and detail, reliability, responsibility, will to succeed and perseverance; Emotional stability - variety of features connected to anxiety and the presence of emotional type problems like depression, mood instability, irritability etc.; Mental openness - openness towards new ideas, towards others and towards one's own feelings. For the Social Area evaluation we used a self-report questionnaire (Psychology Unit ASL TO 5) relative to the following indicators: gender, age, civil status, cultural level and occupation.

RESULTS

From the descriptive point of view, the sample comprises 81 patients (42 Males, 39 Females), with ages ranging between 20 and 51 and average age equal to 37.74 ± 8.74 standard deviations. With respect to civil status, the sample is distributed as follows: single 33.3%, married 55.6%, separated 7.4%, divorced 3.7%. Some 44.4% have attended Junior High Schools, 55.6% High Schools. With respect to occupations the figures are: Student 3.7%, Unemployed 3.7%, Labourer 9.6%, Trader/Artisan 11.1%, Office worker/Teacher 25.9%, Freelance Professional/Manager/Entrepreneur 18.5%, Housewife 7.4%. As regards biomedical indicators, the years of illness in the sample ranged from 1 to 37 years, with an average of 17.26 ± 9.94 standard deviations.

The value of HbA1c ranges from 7 to 10, with average 8.15 ± 0.91 standard deviations. The value of BMI varies between 17.5 and 31.1, with average 24.95 ± 3.36 standard deviations and the data is distributed as follows: *Normal weight* 40.7%, *Overweight* 55.6%, *Obesity* 3.7%. With respect to regularity, the data was first categorised in *No Adherence*, *Average Adherence*, *Good Adherence*; subsequently, the data was further grouped into the two categories *Adherence* (which comprises cases with average or good Adherence) and *No Adherence* (which comprises cases with no or little Adherence) and is distributed as follows: *Eating regularity*: No Adherence 98.8%, Adherence 1.2%; *Insulin regularity*: No Adherence 35.8%, Adherence 64.2%; *Controls regularity*: No Adherence 50.6%, Adherence 49.4%; *Diary regularity*: No Adherence 51.9%, Adherence 48.1%.

In general, we can state that as regards Adherence all patients are pathologically distant from the normative value $HbA1c < 6.5$ recommended by the national guide lines. The majority of patients (59.3%) have overweight/obesity problems; almost all patients exhibit poor eating regularity (98.8%); the majority do not carry out the required glycemic checks (50.6%) and do not enter in their diaries the values of the checked glycemics or the alimentary variations and the insulin boluses carried out (51.9%). On the other hand, and confirming the medical literature in this area, the majority of patients regularly carry out insulin injection (64.2%). Using the BFQ2 it was possible to measure the personality characteristics of DMT1 patients exhibiting Adherence difficulties.

The BFQ2 scores were transformed into T points and subsequently grouped in very low (25-35), low (36-45), average (46-55), high (56-65) and very high (66-75). The data were then further grouped into the following categories: low (25-45), average (46-55) and high (56-75). From the data it can be seen that the sample has higher frequency of low levels of *Energy*, *Emotive stability*, *Dynamism*, *Dominance*, *Scrupulosity*, *Perseverance*, *emotional control*. On the other hand it exhibits a greater frequency of high levels in *Mental openness*, *Cooperation* and *Openness to culture*. The other factors - *Friendship*, *Conscientiousness*, *Cordiality*, *Impulses control* - exhibit greater frequency of average levels. In general, the *Energy* factor with greater frequency low indicates a prevailing tendency of seeing oneself as not very dynamic, active, energetic, dominant.

The greater frequency in the subdimension *Dynamism* low highlights behaviour that is not very energetic and dynamic both in activity and in sociability and enthusiasm. In the same way, *Dominance* too is prevalently low, indicating a poor ability to assert oneself, to come forward and influence situations. The *Friendship* factor with greater frequency average highlights a tendency to



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represent oneself as generally inclined towards cooperation and cordiality, altruism, friendliness. *Cooperation/Empathy* with greater frequency high indicates a good ability at cooperating and emotionally relating to other people and their emotional states in relationships, while *Cordiality*, on the other hand, is present *average*, indicating only an adequate tendency towards affability.

The *Conscientiousness* Factor with greater frequency average indicates a tendency to view oneself as on average able to achieve self-regulation and self-control, over both inhibiting and proactive aspects. The greater frequency is found in the subdimension *Scrupulosity* low, indicating a relative tendency towards caution and methodical behaviour, to reflection as an ability to self-regulate and self-control both inhibitor and proactive aspects. The greater frequency in the subdimension *Perseverance* low, on the other hand, highlights a difficulty in an ability to express persistence and tenacity. In the *Emotional stability* factor prevalently low, the sample views itself with greater frequency as anxious, vulnerable, emotional and impulsive, irritable and impatient. With respect to the subdimension *Control of Emotion* low, the value expressed indicates difficulty in managing states of tension relative to emotional experience.

The subdimension *Control of impulses* prevalently average is such as to make it possible to maintain control of one's behaviour, including in situations involving discomfort, conflict and danger. The *Mental Openness* factor with greater frequency high indicates a tendency to view oneself as cultivated, informed, interested in new experiences and open to contact with new cultures. With respect to the subdimension *Openness to culture* prevalently high, the value expressed indicates a high predisposition to keep oneself informed and up to date, acquiring new knowledge. The subdimension *Openness to experience* with greater frequency of average, making it possible to compare and contrast new developments. To check whether the sample of patients with DMT1 differs from the norm relative to personality factors, we used the T test for a single sample (Tab.3), inserting as the object value of the test the average of the individual factors indicated by Caprara, Barbaranelli, Borgogni, Vecchione (2007).

From a comparison of the averages as set out above, one can clearly see significant differences between the following factors: *Energy* ($t = -4.84$; $p < .01$); *Conscientiousness* ($t = 5.48$; $p < .01$); *Emotional stability* ($t = -5.33$; $p < .01$). In particular, those suffering from DMT1 exhibit average values that are lower as regards *Energy*, *Conscientiousness* and *Emotional stability* with respect to non patients. To check whether in the sample of patients with DMT1 the personality factors differed significantly on the basis of years of illness, the latter were grouped in the categories 18 years of illness and > 18 years of illness. The use of the t of Students for independent samples (tab.4) highlighted that *Energy* is significantly higher under 18 years of illness ($t = 1.95$; $p < .05$), as is *Dominance* ($t = 4.03$; $p < .01$). Above 18 years of illness indicates significantly higher values for *Friendship* ($t = -3.89$; $p < .01$), *Conscientiousness* ($t = -3.38$; $p < .01$), *Cooperation* ($t = -2.28$; $p < .01$); *Cordiality* ($t = -2.8$; $p < .01$).

The use of Anova One Way to compare BFQ2 and BMI Body Mass Index values made it possible to highlight the following significant differences: in Obesity, the *Energy* factor is significantly lower ($t = 4.384$; $p < .01$), as are the values of *Conscientiousness* ($T = 4.880$; $p < .01$) and *Dynamism* ($t = 4.469$; $p < .01$); in patients with normal weight there are significantly higher values for *Dominance* ($t = 12.744$; $p < .01$) and *Scrupulousness* ($t = 11.123$; $p < .01$). The analysis of correlations between BFQ2 personality factors and biomedical and social factors has indicated that: - age is correlated positively with *Scrupulousness* (.310; $p < .01$) and *Cordiality* (.255; $p < .05$); - years of illness are correlated positively with *Conscientiousness* (.284; $p < .05$), *Cooperation* (.263; $p < .05$), *Cordiality* (.264; $p < .05$), *Scrupulousness* (.427; $p < .01$), while they are inversely correlated with *Energy* (-.301; $p < .01$) and with *Dominance* (-.450; $p < .01$); - BMI is positively correlated with years of illness (.284; $p < .05$) and with *Scrupulousness* (.332; $p < .01$), while negatively correlated with *Energy* (-.301; $p < .01$), *Dominance* (-.450; $p < .01$); - Eating regularity is positively correlated with age (.285; $p < .01$),



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with Regularity of insulin (.538; $p < .01$), Regularity of checks (.406; $p < .01$) and the Diary (.489; $p < .01$);- Regularity of checks has a high positive correlation with Insulin Regularity (.773; $p < .01$) and with Diary Regularity (.886; $p < .01$). From the analysis of correlations, moreover, it can be seen that HbA1c does not seem to be statistically correlated with any Personality Factor. Among the social factors correlated with personality, cultural level is positively correlated with *Energy* (.378; $p < .001$), with *Mental Openness* (.561; $p < .001$), *Dynamism* (.235; $p < .05$), *Dominance* (.023; $p < .05$), *Openness to Culture* (.040; $p < .01$), *Openness to Experience* (.525; $p < .01$); negative correlations on the other hand are seen with *Control of impulses* (-.336; $p < .01$).

CONCLUSIONS

Among the most important elements in this initial analysis of data, we were able to verify that all patients not adhering to the therapy have glycate values >6.5 , i.e. greater than the expected norm as suggested by AMD and SID care standards. Starting with the descriptive analysis and the multi-factor correlations noted, the clinical data for the sample has confirmed what is set out in the medical literature: patients with Adherence difficulties do not succeed in maintaining alimentary regularity; regularity of multiple glycemic checks which must be carried out during the day in order to correct the quantity of insulin to be injected; regularity of filling in the glycemic diary and the alimentary variations that must be updated each day; while patients adhere quite well to insulin injections.

The said data confirms how in chronic diabetes the routine of self care processes is very difficult and laborious, especially in that they require lifestyle to be modified and monitored. The data also indicates how difficult and laborious it is to perceive the said modification to lifestyle as therapeutic, above all relative to a pathology that tends to remain asymptomatic for years, until there is the appearance of complications. On the other hand, it is easier to understand that medicine as such i.e. insulin is therapeutic.

In further support of this point, the data has highlighted the interaction between Adherence and personality, suggesting in particular how diabetic patients who have problems adhering to the treatment exhibit low levels of *Scrupulousness*, *Perseverance* and *Energy*, thus finding it difficult to energetically, persistently and tenaciously keep to the methodical and daily sequence of self care actions which the insulin and alimentary therapy of DMT1 requires.

Dynamism and *Dominance* low indicate in these patients a poor ability to assert themselves and influence relationships. *Emotional stability* and low *Emotional control* seem to make educational investment difficult and are inversely correlated with cultural level i.e. an increase in one leads to a decrease in the other. In the sample, females exhibit greater *Emotional Stability* and greater *Impulse Control* and there are also positive correlations between personality and years of illness. It is striking how, among biomedical factors, HbA1c is not statistically correlated with any Personality factor, while BMI is. More specifically, low values for *Energy* and *Conscientiousness* and *Dynamism* are found in Obesity, once again indicating how Adherence factors connected with eating constitute the most difficult problem to tackle for diabetic patients.

With respect to other chronic pathologies, diabetes needs patients to take responsibility for the management of their illness, through behaviour and decisions that profoundly influence their health over the short and long term. Diabetes, in particular, involves specific conflict between the desire for food on the one hand and the dangerous nature of food itself on the other, thereby undermining the reassurance function that nutriment usually embodies.



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